

# Koolhoven F.K.49A HA Models resin

## Ambulance plane

Scale 1:72

First a bit of history of the original aircraft is presented. The Koolhoven F.K.49 has been developed on request of the Dutch Ordnance Survey (Topographische Dienst, TD) and the Air Service of the Dutch Army (Luchtvaartafdeling, LVA) and was operated by the LVA. The cooperation between the TD and the LVA existed already longer and for cartography and aerial photography a Fokker F.VIIa/3m or a Fokker C.IV of the LVA was used, for which only the direct operational cost was charged. The last one was not really fit for the task, the observer/photographer was sitting in open air and the available equipment was limited. The LVA used the first aircraft for other missions too -training, transport, bombing flights- so was badly available. The three-engine plane was also relatively expensive in operating. The Royal Dutch Airlines (KLM) had also an aircraft specifically equipped for cartography/aerial photography, the Fokker F.VIII PH-OTO, but this plane was commercially exploited, so even more expensive.

So an alternative was sought, which was less expensive to operate than these aircraft. When the Koolhoven F.K.48 appeared in 1934, a passenger aircraft accommodating six people and motorized by two De Havilland Gipsy Major engines of 135 horsepower, such an alternative seemed available. From the F.K.48 Koolhoven developed in 1934-1935 the F.K.49, equipped with an on-board dark room.

The F.K.49 has been further developed in three versions with more powerful engines, which were assigned the designation F.K.49A. The first one was an aircraft for cartography and aerial photography for the Turkish Air Force with Ranger V-770 B-4 engines of 305 hp, the second one an ambulance aircraft for the Finnish Coast Guard with Hirth 508C engines of 285 hp, which could be equipped with a wheel or (EDO) float landing gear.

The third F.K.49A version, two aircraft with Argus AS-10-C engines of 200 hp, has been ordered by Rumania. They were. The first two F.K.49A's have been delivered to the customers, the last two, built according to the specification for the Turkish aircraft, were under construction, when the Koolhoven factory was destroyed during the German bombing in 1940 of the Waalhaven airport in Rotterdam. The Finnish aircraft made its first flight on November 3, 1939 and has flown for some time in the Netherlands with floats and orange triangles under the military registration 1001 before it has been delivered to Finland in January 1940. [Here](#) a short movie of this Finnish F.K.49A can be found.



KOOLHOVEN F.K.49  
1:72

LVA

Finnish coast guard

LVA 1940

picture of built model

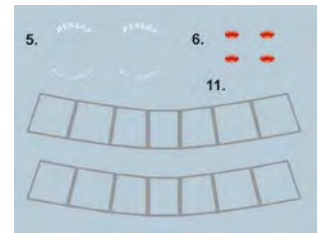
HA Models  
www.hollandaircraft.nl

The kit is the third kit produced by HA Models and comes in an A5 top loader type carton box and contains 58 resin parts, a transparent vacform canopy, assorted pieces of brass and styrene rod, a piece of styrene to produce the control horns, a piece of transparent plastic for the cabin windows and a decal sheet, all packed in separate plastic bags.



The choice is to build the aircraft with a wheel landing gear or with a float landing gear. There are also some small other differences between the aircraft flown in the Netherlands and the aircraft as flown in Finland. This is clearly indicated in the instruction booklet.

Three decal sheets are included: one laser printed sheet for the black registration numbers, one UV laser printed sheet for the coloured decals and one ALPS printed sheet for the metallic and white decals. Especially the ALPS decals must be handled with care, as indicated in a separate instruction packed with the decals.



The decal sheets allow to build two different versions, the version as it has flown in the Netherlands in 1940 with black edged orange triangles and rudder with LVA registration 1001 and the version as it has flown with the Finnish coast guard with civil registration OH-MVE.



The kit contains 1/72 scale drawings of the aircraft, copied from the original Koolhoven drawings.

The instruction booklet illustrates the step by step construction with photographs of the actual building of the model. It suggests also the painting schemes of the model and gives indications for the decal placement.

The main characteristics of the F.K.49A (Finnish version, c/n 4903) are:

	<i>Ref.</i>	<i>1:72</i>	<i>model</i>
<i>Span</i>	16.00 m	222.2 mm	mm
<i>Length</i>	11.80 m	163.9 mm	mm
<i>Height</i>	3.18 m	44.2 mm	mm
<i>Engine</i>	two Hirth HM 508 inverted V8, 285 hp		
<i>Crew/passengers</i>	5		

The model is well to scale, as could be expected for a model that has been produced based on official factory drawings.

**Parts**

I have removed the parts from the sprues. The parts have very few air bubbles, which I have filled with thick cyanoacrylate glue and putty, and they are well detailed. A couple of parts need a warm bath to eliminate their deformation. The parts for the cabin walls had a bar casted at the side of the door opening, which had to be removed.



Next I have dry fitted the aft fuselage, fuselage bottom, cabin walls, wing, engines and propellers. The wing needed some modification. The lengthwise fuselage frame tubes, casted on the wing underside, pushed the cabin wall too far outside. I have removed these tubes. This check is clearly indicated in the building instructions.



All other parts fitted well, I only had to adjust the forward edge of the floor to align it with the forward edges of the cabin walls. The removal of the support bar with a saw caused some loss of material, hence the misalignment. Probably the central opening of the wing will need some minor adjustment before assembling wing and fuselage.



As I want to build the model with deflected control surfaces, I have removed these carefully from wing and tail surfaces with a razor saw. Only one of the ailerons needed a small repair after this exercise. I have marked the port and starboard side of the control surfaces with a piece of tape.



## Fuselage, cockpit and cabin

In preparation of the assembly of the fuselage I have glued a 2.5 x 13 mm strip of 0.4 mm styrene against the enforcement beam on the fuselage bottom. This closes the gap under the solid part of the aft fuselage.



The aft fuselage fitted well on the bottom and has been glued, sparingly applying thick cyanoacrylate glue on the ride casted in the bottom. After a last check I have glued the port cabin wall first to the fuselage bottom and then to the vertical and horizontal part of the aft fuselage.



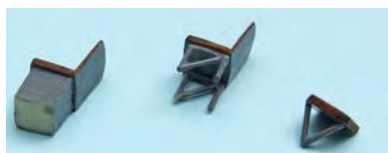
Although I am going to mount the doors in open position, I have still made them fit into the door opening.



As the cabin walls, floor and ceiling are still easily reachable in this stage, I have painted them light grey, as well as the inside of the nose, doors and the starboard wall, taking care to leave the gluing edges free of paint. Three thin layers were required to achieve sufficient coverage on the 0.5 mm thick walls.



In the mean time I have also painted the cabin furniture in various shades of grey and leather, and have assembled the radio rack and seats according to the instructions and the interior drawing. The rack was difficult to assemble due to the small dimensions of the parts. I had also to correct the width of the top radio unit with a piece of thin strip to fit the rack well. I have decided to mount the attendant's seat in deployed position. I have added PE seat belts to the seats.



The rack was difficult to assemble due to the small dimensions of the parts. I had also to correct the width of the top radio unit with a piece of thin strip to fit the rack well. I have decided to mount the attendant's seat in deployed position. I have added PE seat belts to the seats.



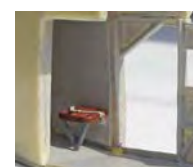
After a minor repair of the damage caused by removal of the part from the sprue I have mounted the rudder bar in the nose. I have also mounted the instrument panel and the control column. This last one has been shortened after dry fitting the pilot seat, the height of which I had adjusted to according to the cabin interior drawing. I have mounted the compass at the left side on the cockpit floor, which seemed to me a logical place.



As this was about the last moment that the folding seat for the nurse could be mounted easily, I have glued it on the notches of the aft fuselage inner wall. Next I have glued the starboard cabin wall in place, using the same procedure as for the port wall. The joint with the floor inside the cabin has been painted.



I have again dry fitted the nose, adjusting the width of the cabin with a piece of tape, and have mounted it to the fuselage. I have dry fitted the radio rack, which appeared to be wider than the two superficial holes casted in the cabin floor. So I have drilled a third 0.5 mm hole a bit more to the left.



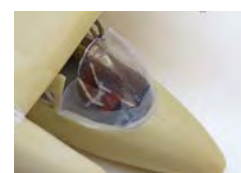
The seat for the pilot and the radio operator have been glued on the small squares cast with the floor.



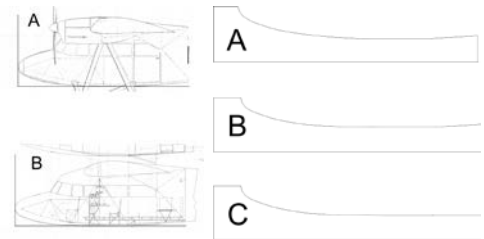
I noticed, however, that the underside of the fuselage was concave instead of slightly convex. Apparently this was because the nose was pointing slightly downward. I have corrected the fuselage underside by applying several layers of putty until it was (at least) flat.



There was another effect of the "drooping" nose, which appeared when I dry fitted the canopy. A large gap appeared between the canopy and the top of the sidewalls and the wing. I first thought to correct that with the vacforming of new, oversized canopies, but in the end I decided to apply a more fundamental approach.



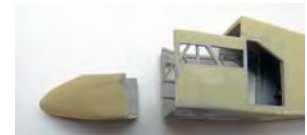
First thing was to devise a template to measure the degree of misalignment. For that I have traced the forward lower part of the fuselage in each of the two Koolhoven side views that I had. The first trace (A) showed too much curvature to match with the aft part of the fuselage underside of the model, which was flat, as it was identical to that of the Koolhoven F.K.49. The second trace (B) fitted better, but was still too much curved at the location of the door, so I have produced a variant of this trace, (C), with a straight aft part. I have fitted template (C) to the model. That showed that the tip of the nose was a couple of millimetres too low. This fitted also with the gap at the canopy; correction of the nose position most likely would solve the canopy problem also.



I have removed the pilot seat, separated the nose from the fuselage by means of the razor saw on the joint of the nose with the cabin floor and walls. Next I have sanded the top of the sidewalls of the nose a bit down until the bottom of the fuselage corresponded well with template C, which I will include in the F.K.49A kits. I have glued the nose in place and have sanded the (new) joints carefully. At the meantime I have also filled the one extra hole for the radio rack with putty. The pilot seat has been glued to the square again after correcting the underside of the seat for the larger slope of the cockpit floor.



Now I could mount the radio rack in the cabin, securing it to the floor and to the tube frame of the side wall with some drops of glue.



I have glued two legs made of 3.5 mm strip with 0.4 x 0.5 mm cross section under the aft stretcher to get it horizontal when stowed in the cabin and four of those leg under the stretcher next to the radio operator. Straps have been made from Tamiya tape, painted leather and provided with an aluminium buckle.



The rear stretcher did not fit next to the extended folding seat, so I have removed it and placed it again in a folded position. So if it is intended to make the model with stretchers and a deployed seat for the nurse, 0.5 mm has to be removed from each side of the stretchers.



Next I have removed the canopy from the vacform sheet, carefully fitting it to nose and fuselage sidewalls. Using white glue, I have first glued the lower edge of the canopy to the nose and, when that had set, the rear edges to the sidewalls. Dry fitting the wing on the fuselage shows that a gap of 0.5 mm wide remains, which can be closed with pieces of thin strip and wide glue. The last thing to do was to glue the overhead instrument panel with a bit of white glue on the inside of the canopy above the middle window of the wind shield.



As the fuselage was now complete, I have prepared it for painting. First thing to do was produce "shutters" for the window and door openings. I have made these from two strips of carton, 6.5 and 13 mm wide. Trial and error I have fitted the shutters and have marked them with a location indication.



Next the paint masks had to be applied on the canopy. I have prepared the paint masks in my established method by gluing under the paint mask drawing a piece of writable transparent tape and under that a piece of Tamiya tape. After cutting out the



shapes I have peeled off the Tamiya tape, which served as paint mask. However, it was rather difficult to align the individual shapes well, so in the end I have decided to make one paint mask for the complete set of windscreen windows and to make the vertical members either by painting them or by using the window frame decal in the decal set. In the meantime the canopy



had come loose from the fuselage; apparently the white glue could not support the bending of the canopy when applying the paint masks. So I have glued the canopy again in place with Kristal Klear, which stays more flexible when set. I have glued the shutters in the fuselage by applying tiny drops of Kristal Klear on the edge of window and door openings.



## Wing

After removing the ailerons I have glued the forward part of the engines to the wing, aligning top and sides well; the lower side sticks out a bit, modeling the exhaust space for the cooling air. I have marked the underside of the wing, which will serve as ceiling for the cabin, with a pencil and have painted it light grey.



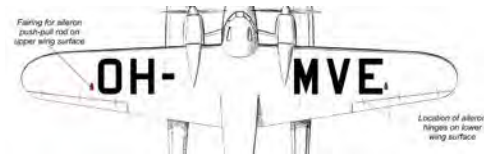
When the wing was fitted to the fuselage, quite a large gap appeared between the cabin wall and the underside of the wing. I have filled that gap with pieces of styrene sheet, sanding it well until wing and fuselage fitted smoothly.

I have glued the wing to the top of the cabin walls. The gap between the canopy and wing and side walls I have filled with white glue, applied with a metal wire and in several layers.



No control cables for the ailerons are shown on the drawings and the photographs show that there are none at the wing underside. No pictures exist of the top surface of the wing; I have assumed however, that there were push-pull rods at the same location as the cables of the F.K.49, at the outer side of the third panel line from the tip and slightly in front of the rear spar.

I have made the fairings for the push-pull rod with a slanted cut through a rod of 1.4 mm, glued on the locations indicated above, in which I have drilled a 0.5 mm hole. I have also adapted the top view drawing to show these locations and the place of the aileron hinges. I have cut from 0.4 mm sheet two control horns and have glued them opposite the location of the push pull



rod on the upper side of the ailerons.



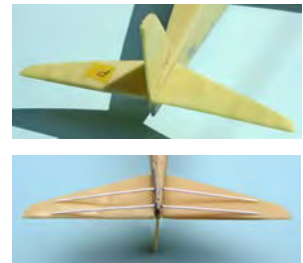
## Tail surfaces



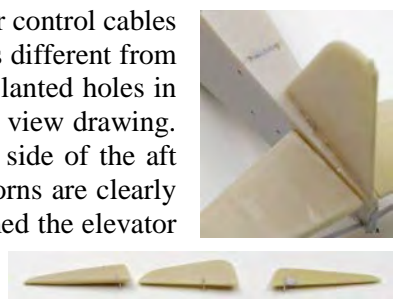
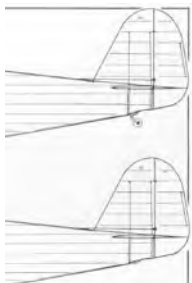
I have removed the casted pins of stabilizer halves and fin, as they provide hardly any structural support and have drilled a 0.4 mm hole on these locations and have fitted a 0.4 mm brass pin in them. Next I have glued the tail surfaces to the fuselage after checking the position of the holes casted in

the fuselage. These appeared to be correct for the stabilizer halves; they only needed to be deepened a bit. For the fin I have drilled a new hole.

I have made four stabilizer struts from 0.6 mm rod, chamfered at the joint with the stabilizer and have reopened the four casted holes for the fin rigging lines.



The photographs of the F.K.49A and the drawing in ref. 8 show that the rudder control cables are routed from the top surface of the aft fuselage, which is different from the routing for the F.K.49. So I have drilled two 0.3 mm slanted holes in front of the fin and have indicated their location in the top view drawing. As a consequence the lowest slanted holes, casted on the side of the aft fuselage, have to be closed. On the photographs control horns are clearly visible at the underside of the tail planes, and I have assumed the elevator halves have conventional control cables. I have cut control horns from the piece of 0.4 mm plastic sheet and fitted them in holes superficially drilled in elevator halves and rudder.



## Propellers and nacelles

The joint between the engines and the wing was quite wide, as the edges of resin parts are always a bit rounded, even when the masters have sharp corners. So they have been treated amply with putty.

The underside of the nacelles had to be adapted to the float version of the aircraft,



which I had decided to model. So the 1 mm hole on the center line has been closed (it is only for the wheel version) and a second hole of 1 mm had to be drilled 3 mm in front of the existing outboard hole to accommodate the modified configuration of the float struts. In any case, the diameter of all casted holes were slightly smaller than intended, which usually happens in casting, so had to be revisited to be brought up to standard. I have painted the propellers aluminium with a red spinner.



After assembly of wing and fuselage it was time to apply the paint. I have chosen to build the model with the yellow identification marks on fuselage and wing underside, as introduced from June 18<sup>th</sup>, 1941.



To avoid marks of the masking tape on the aluminium finish, I have painted the stripes before applying the aluminium. When well dry, I have taped the yellow parts and have painted the whole assembly aluminium with the airbrush. I have unpacked the model and only on two places the paint was slightly damaged, which was easily repaired with a small brush. The technique with the “shutters” for windows and doors worked well; there was no overspray in the interior.



I have cut control horns for rudder, elevator halves and upper side of the ailerons from 0.4 mm sheet and have glued these to the control surfaces. The control horns have been painted dark grey after air brushing the control surfaces aluminium.

To produce the cabin windows I have repeated the process I had followed to make the window “shutters”. I have cut a strip of transparent plastic with a width slightly larger than the window height, marked the corners of the window frames on it with a black drawing pen, cut them out and have made them trial and error fit to the openings. I have glued them in place with tiny drops of Microscale Kristal Klear, applied with a piece of thin metal wire.

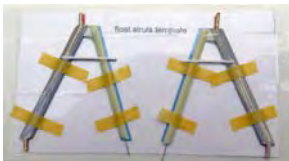


### Wheel undercarriage and floats

First I have constructed the main float and undercarriage struts from the half streamline profiles and brass rod provided with the kit. Although I am going to build the F.K.49A in Finnish uniform, but with floats, I have also used the model to check that the F.K.49 procedure to construct the undercarriage works also for the F.K.49A.



I have modified the floats in a port and starboard version as indicated in the instructions and have made a dry fit of floats and main struts with the model. To



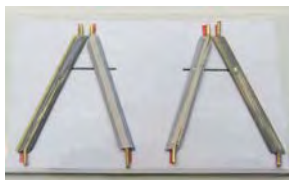
get a more solid and easier to assemble configuration I have glued the forward resin and the aft brass reinforced member of the inverted V-struts together with



a small triangle of 1 mm plastic sheet. However, a dry fit of these inverted V-struts showed that the resin struts were not stiff enough; they took whatever shape, which fitted with the position of the floats and the reinforced aft strut and the orientation of the holes drilled in float and nacelle. I estimated that this would result in an almost impossible assembly job and a guaranteed failure of the resin strut after a short while.

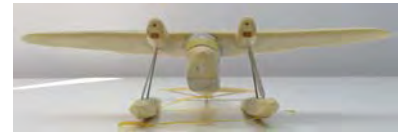


So I have decided to modify the forward strut also in a version with 1 mm brass core and have modified the template accordingly. Also the floats had to be modified; the forward 0.5 mm hole had to be enlarged to 1 mm.



After producing the forward struts I have again dry-fitted struts and floats under the model. Although the results were a lot better, it stayed difficult to align floats, struts and model well. So some more alignment aids were required.

I have first made the reference points for the aft member of the float N-struts and the wheel undercarriage V-struts in the lower edge of the fuselage sides with a small V-cut, as indicated in the instructions.



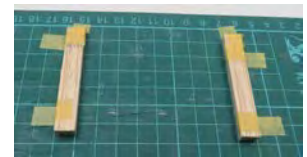
Next I have measured from the drawings the position of the float inverted V-struts relative to this point and have drawn a carton jig defining also the distance between float and the lower edge of the fuselage. With this jig I have aligned the float with the fuselage, which required still quite some adjustment of the angle of the brass tabs of the struts. It was therefore necessary to mark the starboard and port struts. On the basis of this exercise I have drawn the jig in CorelDraw, both for the port and for the starboard float to ensure symmetry; a print on carton will be included in the kit.



I have placed the float struts in the holes in the nacelles and in the floats. I have cut out the two jigs and fixed them with tape to the fuselage bottom after checking whether the width of the cut-outs for the struts were wide enough (they were not, they needed a slight adjustment. Next I have applied drops of thin cyanoacrylate glue on the joints between nacelle and struts with a thin metal wire. This attacks the aluminium paint, but that can easily be retouched afterwards.



Although the joints were well attached after drying, the whole assembly stays quite fragile, so I did not dare to turn the model over and put it on the floats for gluing the joints between floats and struts. So I have improvised a jig to support the floats. I have measured the distance between the outside of the floats (in my case 80 mm) and have taped two pieces of wood on a cutting mat, separated by that same distance. This helps also to keep the floats well parallel. I have turned the model over, placed it between the pieces of wood and have glued the joints between floats and struts. When this had set, the model has been removed from the jig and the carton jigs have been removed.



The next step was to fit the N-struts between floats and fuselage. The resin parts did not fit at all; they were a couple of millimeters too short and the forward leg of the N, which should connect the float with the nose, did not take into account that the nose was not straight, but curved, a clear error of conception. Also, they were not very sturdy, the members being only 1.8 mm wide. On the Koolhoven drawing they were 2.2 mm wide, on the Finnish drawing even 3 mm wide. So I have drawn new N-struts and have produced them from 3.1 mm wide styrene streamline profile. A second pair has been produced to serve as masters for new parts replacing the original N-struts.



**Decals**

To test the resistance of the decals to handling, I have used them without the application of a protective layer over the prints. The very small ALPS decals for propellers and tires did not given any other problem than cutting them out; the handled well and were not damaged. They tolerate SEL and SOL very well.



Although I will not need the wheel undercarriage, I still produced the main struts as an illustration for the instruction sheet. The text on the tires were very sharp and well readable, much better than the UV laser printed decals for the F.K.49.

The laser printed black registration decals are very thin and rather strong, but are sensitive to folds. On the flat lower surface of the wing this did not show up, as very little manipulation of the decal after application was necessary. These decals also tolerate SET and SOL very well. What could be noticed, however, is that the printed area of the decal expanded differently from the transparent, non-printed part, which caused some stress concentrations, which disappeared in drying.



Application of the decals on the wing upper surface was more problematic. I had pre-cut openings for the aileron push-pull rod fairings in the "O" and the "E". The curved surface caused some small folds, where the black print disappeared, and the aluminium was showing through. I have corrected the damaged spots with matt black paint; after application of a gloss acrylic varnish sealing the correction was hardly visible any more.



The decals on the aft fuselage behind the trailing edge of the wing and centred between top and bottom of the fuselage went again easy, although some minor damage occurred.



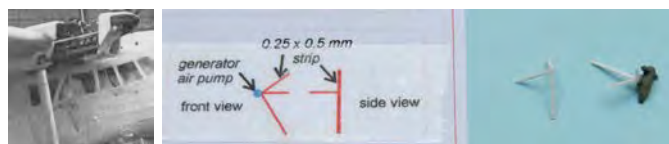
A general conclusion is, that all decals, independent of the printing method, should be provided with a protective cover of e.g. Microscale Liquid Decal Film or a water based acrylic varnish. Solvent based varnishes damage the ALPS printed decals.

I have applied the silver printed cockpit window frames, from which I had cut out the inner transparent part, after the mounting of the cabin windows.

## Last details

### Exhausts

The OH-MVE apparently had the generator/air pump at a certain time mounted on a frame on the starboard fuselage side. I have first constructed a frame from 0.25 x 0.5 mm strip, but this was too fragile and difficult to handle, so I have redone the job with 0.4 x 0.5 mm strip. I have mounted the air pump on it.



### Venturi tubes

### Pitot tube

### Antenna

## Summary

Below some pictures of the finished model are shown.







## References

1. Anon., *Koolhoven Vliegtuigen, 1910-1940*, Facsimile uitgave, 1940
2. H. Hooftman, *Van Brik tot Starfighter, Deel I: Met stofbril en leren vliegkap*, La Rivière & Voorhoeve, Zwolle, 1962
3. Koolhoven, *Tekening no. 1103 S, Type F.K.49, No. 4903, Ausstattung der Kabine*, N.V. Koolhoven-Vliegtuigen, 1939
4. Koolhoven, *FK-49*, N.V. Koolhoven-Vliegtuigen
5. H. Van der Meer, *F.K.49*, Stichting Koolhoven Vliegtuigen, 1999
6. T. Wesselink & T. Postma, *Koolhoven, Nederlands vliegtuigbouwer in de schaduw van Fokker*, ISBN 90 228 3890 0, 1981
7. H. van der Meer/Aviodrome, *Personal communication, Drawings of F.K.49A*, 2018
8. J. Raunio, *Taattua laetua, Merovartiolaitoksen Koolhoven F.K.49A*, SIL 3, 1999
9. D. Top, *Frits Koolhoven en zijn Vliegtuigproductie*, 1996
10. A den Ouden, <http://www.alexdenouden.nl/artikelen/koolhoven06.htm>

## Appendix F.K.49A documentation

### Paint table

H = Humbrol, R = Revell, V = Vallejo, WEM = White Ensign Models

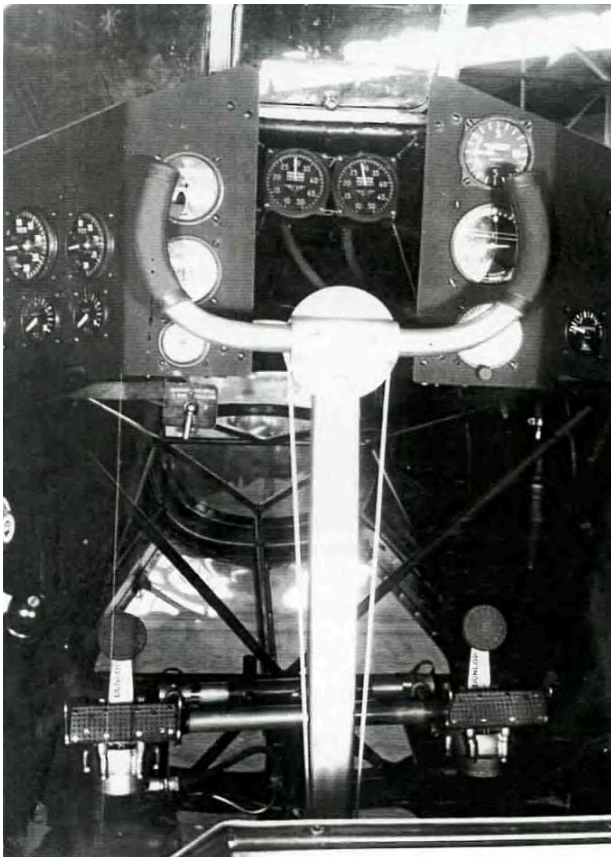
Code	Colour	Where
H21	Black	Instrument panel dials
H19	Red	Propeller spinners
H33	Black (matt)	Control column handles
H62	Leather	Seat cushions
H69	Yellow	Identification marks on wing and fuselage
H113	Rust	Exhausts
H129	Light grey	Dark room walls, ceiling and floor; cabin floor, wheel hubs
H134	Dark grey	Instrument panels, wheel hubs, rudder bars, control horns, aileron hinges
H1325	Transparent green	
R731	Transparent red	Navigation light
R36178	Tank grey	Tires
V71.062	Aluminium	All outer finishes.
V71.072	Gun metal	Exhausts (dry brush)

### Photographs

If no reference is given, the pictures have been taken from the Internet/Wikipedia.



[Source: ref. 5]



[Source: ref. 5]



[Source: ref. 2]



[Source: ref. 2]



[Source: ref. 9]



[Source: ref. 5]



[Source: ref. 5]



[Source: ref. 5]



[Source: ref. 10]



[Source: ref. 2]



[Source: ref. 5]



[Source: ref. 5]



[Source: ref. 9]

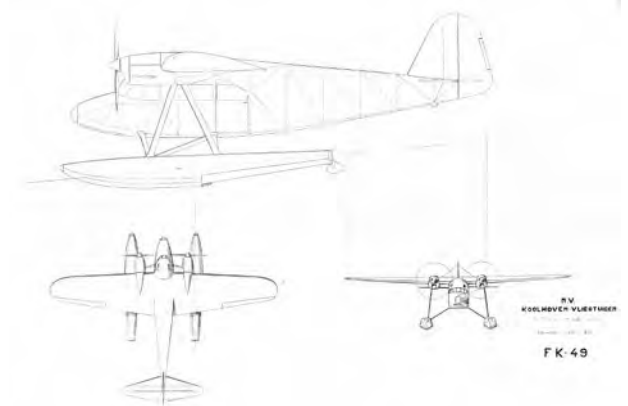


[Source: ref. 8]

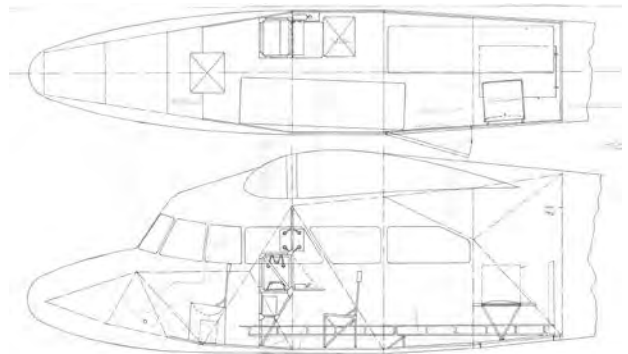


[Source: ref. 8]

**Drawings**



[Source: ref. 7]



[Source: ref. 7]

**Certificate of Airworthiness (CoA) of the Finnish F.K.49A (courtesy Harry van der Meer/Aviodrome)**

